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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09:707,009	11/06/2000	Lin R. Higley	OBC-101	5944

24963 7590 04/24/2003

ENERGY CONVERSION DEVICES, INC.
2956 WATERVIEW DRIVE
ROCHESTER HILLS, MI 48309

EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 04/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

H-0

Office Action Summary

Application No.

09/707,009

Applicant(s)

HIGLEY ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-13, 17-28 and 32-53 is/are pending in the application.
- 4a) Of the above claim(s) 6, 21 and 36-53 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-11, 13, 17-20, 22-24, 26-28 and 32-35 is/are rejected.
- 7) ☒ Claim(s) 12 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>10</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This communication is responsive to the amendment filed 03/29/03. The applicants have overcome the objections and the 35 USC 112 rejections. However, the claims are finally rejected as the 35 USC 103 rejections is herein maintained for the reasons of record.

Election/Restrictions

1. This application contains claims 6, 21 and 36-53 drawn to an invention nonelected with traverse in Paper No. 6. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 7-11, 13, 17-20, 22-24, 26-28, 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein 5478363 in view of Sindorf 5059496.

The instant claims are directed to a multi-cell battery wherein the disclosed inventive concept comprises the particular gas port passage therein.

With respect to claims 7 and 22-24, 27:

Klein discloses a multi-cell battery made by stacking several wafer cells (col 5, lines 61-62). It is disclosed that the electrodes, the separator between the electrodes and the electrolyte are contained within an enclosed wafer cell (col 5, lines 1-5). The enclosed wafer cell may be

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completely sealed or it may be provided with vents for release of excess pressured gas (col 5, lines 15-20). It is further taught that alternatively, the stack may be contained in an outer battery housing that serves as the battery housing (col 6, lines 15-20). If the cell stack is contained in an enclosed outer housing, the outer housing can serve to provide stack compression and the housing maybe sealed or vented (col 6, lines 24-27). Figure 3 shows an embodiment in which the multiple cells each have a small vent port and the cells are contained in a sealed container which serves as the battery housing (col 6, lines 27-30). It is also disclosed that a non-conductive material maybe sealed peripherally to the outer layers to form a border material around the entire perimeter of the electrodes such as to form a sealed enclosure containing the pair of electrodes, the separator and the electrolyte within the wafer cell (col 5, lines 7-10).

It is taught that the electrolyte is alkaline (col 5, lines 46-49). It is disclosed that the battery is a nickel-metal hydride (col 3, lines 1-3/ col 3, lines 15-20). It is also disclosed that the negative electrode is a bonded metal hydride ally powder that can store hydrogen (col 4, lines 46-50); and the positive electrode is made of nickel hydroxide (col 4, lines 55-60).

As for claims 8-10, 19-20, 26, 34-35:

It is disclosed that the border material is preferably of a polymeric material that may be heat sealed to the outer layers wherein the polymeric material is preferably a vinyl polymer (col 5, lines 10-14) It is also taught that the outer layers are sealed peripherally to an electrically non-conductive polymeric material such as to form a sealed enclosure containing the electrodes, the separator and the electrolyte (col 3, lines 21-30)

As to claim 13, 28:

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It is disclosed that the cells are electrically arranged in series with the positive face of each cell contacting the negative face of the adjacent cell (col 5, lines 61-65).

As to claims 18, 33:

It is disclosed that the cell showed no indication of pressure above 20 psi during the cycle operation (col 11, lines 13-15). Thus, the battery operates at a pressure of at least 10 psi.

As far as claims 17, 32:

It is disclosed that the compact stack assembly is held in compression to insure uniform physical contact between the adjacent cells and between the respective layers within each cell (col 6, lines 4-8); and if the cell stack is contained in an enclosed outer housing, the outer housing can serve to provide stack compression and the housing may be sealed or vented (col 6, lines 24-26/ col 6, lines 37-39); or the stack may contained internal rods to insure uniform compression and contact of the cells (col 6, lines 37-39).

Klein discloses a multi-cell electrochemical battery according to the foregoing. However, Klein does not expressly teach the cell enclosure preventing passage of the electrolyte out of the cell wherein the material is either gas permeable or hydrophobic.

Sindorf discloses a plurality of nickel-hydrogen cell modules suitably contained in a housing (col 11, lines 65-68) so as to provide for rapid gas diffusion, each cell has a port, provided in the housing to allow gas access to the interior of the hydrophobic housing port wherein the port comprises a filter suitably made of a non-wetting porous material or a plate made of sintered polymeric material which allows gases, in particular hydrogen gas, to pass freely through the filter but will not allow liquid electrolyte to pass through and escape from the cell (col 12, lines 25-40/ claims 1, 11-12); the filter is of sufficient are to permit the flow of

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hydrogen in and out through the port; the non-wetting character of the filter and the housing tends to reject the liquid electrolyte from their surfaces in favor of the components such as electrodes, separators, and absorbers which are typically hydrophilic (col 12, lines 25-40/claims 1, 11-12). Figure 5 shows the gas port and the hydrophobic material therein protruding out of the enclosure.

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make Klein's enclosure preventing escape of electrolyte out of the cell and made from a material which permeate gas or hydrophobic as Sindorf teaches a cell housing for cell modules and electrolyte that maintains the proper electrolyte concentration in the cell and prevent electrolyte bridging and a gas port in each cell housing to allow flow of gas into and out of the housing without the exit of electrolyte. Accordingly, this maintains the proper electrolyte concentration in the cell and prevent electrolyte bridging; and the non-wetting character of the filter and the housing tends to reject the liquid electrolyte from their surfaces in favor of the components such as electrodes, separators, and absorbers which are typically hydrophilic. Thus, this electrolyte management feature allows the battery or cell supplied with sufficient electrolyte, to deliver maximum energy both early in service life and after thousands of cycles.

Additionally, it is also noted that Klein inherently discloses that the electrolyte does not come out of the cell as Klein teaches that a non-conductive material may be sealed peripherally to the outer layers to form a border material around the entire perimeter of the electrodes such as to form a sealed enclosure containing the pair of electrodes, the separator and the electrolyte within the cell. Thus, those of ordinary skill in the art will obviously understand that a sealed enclosure does not allow electrolyte to pass out of the enclosure.

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With respect to the material being either gas permeable or hydrophobic, it is also noted that Klein inherently discloses a material having gas permeability and hydrophobic properties as Klein teaches that the border material is preferably of a polymeric material wherein the polymeric material is preferably a vinyl polymer. Thus, those of ordinary skill in the art will also recognize that Klein's specific polymeric material, at least to some extent, shows a gas permeability and hydrophobic behavior. It is also noted that Klein's material is a polymeric one as the specific material of the instant claims. Thus, since no specific degree of gas permeability has been set forth so as to particularly define the quality or state of being capable of being permeated or penetrated, the claims obvious over the prior art of record. As well as, it is understood that a polymer of a vinyl compound or a product made from such a polymer lacks affinity for water as instantly recited.

Allowable Subject Matter

1. The following is a statement of reasons for the indication of allowable subject matter: it was set forth in a prior office action, refer to paper # 7
2. Claims 12 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

3. Applicant's arguments have been fully considered but they are not convincing. The main contention of applicants' argument is premised on the assertion that the primary reference is

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directed to a first battery chemistry but does not teach the specific gas permeable membrane allowing passage of gases but preventing passage of the electrolyte, and the second reference does teach such gas permeable membrane but is directed to different battery chemistry. In this regard, the examiner points out the following: a) the primary reference teaches a nickel-metal hydride battery employing an alkaline electrolyte comprising an aqueous solution of one or more alkali hydroxides such as lithium hydroxide and potassium hydroxide; b) the secondary reference teaches a nickel-hydrogen battery comprising an alkaline electrolyte comprising potassium hydroxide in lithium hydroxide; c) the main difference between both cells appears to be the specific cathode active material employed therein. In light of this, the examiner likes to assert that the chemical nature of the two cells is substantially the same, that is, both cells are related to alkaline chemistry. Furthermore, since the main purpose of the specific gas permeable membrane and/or the hydrophobic material is to prevent passage of the electrolyte out of the cell, and having mentioned above that the electrolyte materials are substantially the same, those of ordinary skill in the art would obviously recognize that using the port/filter feature of the secondary battery would not affect the battery chemistry and functionality of the primary reference. Accordingly, given that the chemical environment of the two batteries of the applied art is substantially the same, those of ordinary skill would envision substituting or interchanging a miscellaneous battery component which is inert (or does not affect) to the battery chemistry. Unless evidence is supplied to show that Klein's battery cannot function with the particular port/filter feature of secondary reference or the port/filter feature imparts detrimental effects in the battery of Klein the instant claims are still obvious. Thus, the burden is shifted to applicants to provide objective evidence demonstrating the foregoing.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary examiner, Steve Kalafut can be reached on (703) 308-0433. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

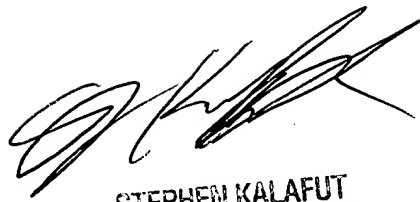
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

 **STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP** 1200

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Raymond Alejandro
Examiner
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